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SOME OBSERVATIONS ON THE BIOCHEMICAL AND PHYSIOLOGICAL EVENTS ASSOCIATED WITH DIARRHOEA IN CALVES

BY

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Diarrhoea in calves is one of the most serious diseases which beset the young animal. In the recent survey by Withers (1952) it was found that no less than 33 per cent. of the deaths of calves could be attributed to infantile scours, diagnosed as being either due to coliform infection or of nutritional origin.

It is well established that immunity of the calf to systemic infection by strains of *B. coli* is conferred by the ingestion of colostral antibodies against the strains concerned (Smith & Little, 1922; Briggs *et al.*, 1951). This does not mean that ingestion of colostrum necessarily confers resistance against any alimentary disturbance, and nutritional and dietetic entities have been postulated as important factors in the aetiology of both fatal and non-fatal scours. Claims have been made that vitamin A and members of the B complex are concerned (Phillips, Lundquist & Boyer, 1951), but these have not been substantiated (Hibbs & Krauss, 1947; Nevens & Kendall, 1947). Similarly, factors in the nutrition of the dam have been postulated as causative agents by Shanks (1950) and by Inglis (1952), and this evidence cannot be ignored.

During the last five years many metabolic experiments have been made at the Hannah Dairy Research Institute with suckling calves given rations of various types, and the purpose of the present paper is to summarise the information obtained relative to alimentary disturbance. Only in some instances were the experiments carried out solely with the purpose of studying alimentary disturbance. Details of the experimental and analytical techniques used and the methods employed to collect the excreta quantitatively are given in a series of papers published in the *British Journal of Nutrition* in 1951 and 1952.

1. THE WEIGHT OF FAECES PRODUCED BY NORMAL AND SCOURING CALVES

The normal calf when given whole milk only produces very little faecal material. Daily weights of fresh faeces from a healthy calf given whole milk (8,000 g. daily) over a period were: nil, 308, nil, 35, nil, nil, nil, 141, nil and 60 g. This sequence of faecal weights is quite typical and the same pattern of faecal output occurs when artificial rations simulating milk are given. Thus with an artificial diet a typical series of daily faecal weights were: 40, nil, 111, nil, 169, nil, 183, 60, nil, 53, nil, nil, 220 and 120 g. Commonly no faeces are produced for several consecutive days—often as many as five days. Faeces passed following these long intervals are almost black in colour and contain 25 to 35 per cent. dry matter. Their passage occasions no difficulty. The mean loss of faecal material by the normal calf averaged over long periods was 50 to 60 g. daily, corresponding to 15 to 20 g. dry matter.

Varying degrees of scouring can be recognised. Each is characterised by a large increase in faecal loss. Thus with one scouring calf the following sequence of faecal weights was obtained when the calf received 4,000 g. of diet daily: 118, 495, 1,165, 1,797, 935, 2,503, 1,063, 86, 186, 1,380 900 and 548 g. This pattern of faecal weights, in the absence of any treatment, is typical, and indicates that the weight of material which may be lost from the bowel in one day may be more than 40 times the normal. Partial recovery often occurs at various stages, when faecal weight falls to more usual values. The faeces produced during scouring vary markedly in consistency, from a pasty pale yellowish mass associated with large amounts of faecal fat, to a thin greenish soup with a dry matter content of less than 5 per cent. The clinical signs observed with these calves during severe scouring are dullness, ataxia, loss of appetite and dehydration. Body gain declines markedly, in fact often becomes negative, body temperature falls and loss of hair from the constantly stained parts of the body takes place.

2. THE MATERIALS LOST IN THE FAECES DURING SCOURING

Wide deviations from the normal pattern of faecal output are easily recognised and are in practice called scours. There is no distinct demarcation between a normal output and one which may be called abnormal and so some arbitrary classification is necessary. The classification we have adopted is as follows: A faecal weight of 0 to 200 g. daily has been called "normal," one of 200 to 500 "loose," and one over 500 g. "diarrhoeal." Table I summarises 160 analyses of the faeces of eight calves on 20 occasions. The calves were all given a constant amount of a diet composed of margarine homogenised into skim milk.

TABLE I

MEAN AMOUNTS OF THE MAJOR CONSTITUENTS EXCRETED IN NORMAL AND SCOURING FAECES—ARTIFICIAL DIETS

Constituent (g. per day)	Classification of faeces samples			Ratio of "Diarrhoeal" to "Normal"
	"Normal"	"Loose"	"Diarrhoeal"	
Water ...	51·0	280·0	927·0	18·2
Dry matter ...	12·5	42·5	93·5	7·5
Total fat ...	4·1	17·5	37·4	9·1
N × 6·25 ...	5·5	22·3	41·0	7·5
Ash	1·5	5·3	10·6	7·1

These results show that the increase in the amount of faeces produced during scouring is mainly due to an excretion of water: in fact, the percentage dry matter of the faeces can be used as a measure of the intensity of diarrhoea. A marked increase in the excretion of dry material takes place, more particularly in this instance in the fat content, though it is evident that the excretion of protein and ash are increased to nearly the same degree. It often happens that fat excretion is not specifically increased, that is, it remains a constant proportion of

the faecal solids. Clearly these losses of fat and protein effectively reduce the nutritive value of the diet. Apparent digestibility falls from about 97 per cent. to as low as 40 per cent. for these entities. Furthermore, as Sellers & Eden (1949) have shown, vitamin A is lost in greater amounts. This we have found to be true also of vitamin E, and undoubtedly it applies to all fat-soluble vitamins.

3. Fractionation of the Faecal Fat

The more detailed composition of the protein and fat moieties of the faeces of the same calves described in Table I are given in Table II.

It will be noted that marked changes took place in the amounts of all components. The increase in free fatty acid excretion was outstanding and was of the same order of increase as the coliform count—a significant observation. The increase of steam volatile acid and of "total fat" was also considerable, while soaps in the faeces increased to only a relatively small extent. These results no doubt are due to the more rapid passage of material through the digestive tract. By using diets in which the fat was stained with Sudan IV it was shown that the first appearance of the dye in the faeces of scouring calves was after six hours, whereas with the normal calf it was after about 48 hours. The rate of passage through the small intestine relative to that of the large intestine is not known, though the low absorption of fat and other nutrients suggests that the small intestine is primarily affected. Since the increase in bacterial counts paralleled the increase in free fatty acids so closely, it is evident that the unabsorbed material had undergone bacterial fermentation. The increase in purine N, which was probably largely of bacterial origin, the increase in production of steam volatile fatty acid and the fall in the *p*H of the faeces all suggest that a massive fermentation of undigested and unabsorbed feed had taken place in the intestine. This would place the primary metabolic defect in the scouring calf fairly high in the intestinal tract.

Table II

Mean Amounts of Fatty Constituents and of Purine N Excreted per Day, the Total Coliform Count and the *p*H of the Fresh Faeces (Artificial Diets)

Amount of component excreted per day	Classification of faeces samples			Ratio of "Diarrhoeal" to "Normal"
	"Normal"	"Loose"	"Diarrhoeal"	
*Purine N (mg.)	—	77·0	270·0	—
Nonsaponifiable material and neutral fat (g.)	1·5	5·3	10·6	7·0
Soaps (g.)	1·9	6·2	8·3	4·4
Free fatty acids (g.)	0·7	6·0	18·5	26·4
Steam volatile fatty acids (ml. N/10 acid)	164·0	428·0	1,056·0	6·4
Coliform count × 10^8	118·0	1,079·0	2,907·0	24·6
*p*H	6·8	6·2	6·0	—

* Krüger-Schmidt separation.

4. Mineral and Water Losses in the Faeces

The high water losses have already been noted. The minerals lost in the faeces of scouring and normal animals are given in Table III.

It may be seen that the amount of Ca plus Mg, which together with phosphates account for the major part of the ash of both milk and faeces, increased during scouring at approximately the same rate as did the excretion of soaps. Phosphorus excretion was closely comparable. With Na and K, however, the increase in loss was considerably greater. In some calves the increased excretion of the sum of these two electrolytes was almost entirely due to Na, in others a considerable loss of K was observed. The latter was related to whether or not the animal was losing weight, that is, releasing K from the catabolism of muscle cells and other soft tissue. In every instance, however, the sum of the two electrolytes increased with the amount of water excreted and this has been typical of many experiments in which Na and K metabolism has been studied. In the latter experiments the correlation coefficient between the sum of the excretion of Na + K expressed as mg. equivalents and the water excretion over the range 10 to 2,200 g. of water was 0·88, which is highly significant statistically. These facts suggest that, since the excretion of Na + K in the faeces often exceeded intake, base was secreted into the intestine in large amounts during scouring and little net reabsorption took place.

5. Metabolic Adjustments to the Faecal Loss

With considerable technical difficulty complete metabolic balances on acutely scouring calves have been made and typical results are given in Fig. 1, which compares two calves given the same diet, one producing normal amounts of faeces and the other having diarrhoea.

It will be noted that despite the large increase in the excretion of N in the faeces, there was no decline in the excretion of N in the urine. This is understandable since body tissue was being broken down to provide energy to the animal, in fact it is more usual to find a slight increase in urinary N excretion. Similarly, more detailed results show that P excretion in the urine often increases, presumably for the same reason. Ca and Mg are present in the urine in only small amounts in both normal and scouring animals, the major channel of loss being the faeces. The important feature of the data is that the excretion of Na and of K in the urine declined only slightly despite heavy losses in the faeces. This is also shown from other studies in which it was found that while normal calves excreted in their urine 124 mg. equiv. of Na and K daily,

Table III

Mean Amounts of Mineral Elements Lost in the Faeces of Normal and Scouring Calves

Amount of mineral excreted (mg. equivalent per day)	Classification of faeces samples			Ratio of "Diarrhoeal" to "Normal"
	"Normal"	"Loose"	"Diarrhoeal"	
Calcium	21·6	31·2	98·8	3·7
Magnesium	11·4	16·0	24·0	
Sodium	5·0	9·5	41·6	11·3
Potassium	2·2	3·0	39·9	
Phosphorus	21·0	39·0	94·0	4·4

NITROGEN AND MINERAL INTAKE, EXCRETION, BODY STORAGE OR LOSS BY NORMAL CALVES AND THOSE WITH DIARRHOEA

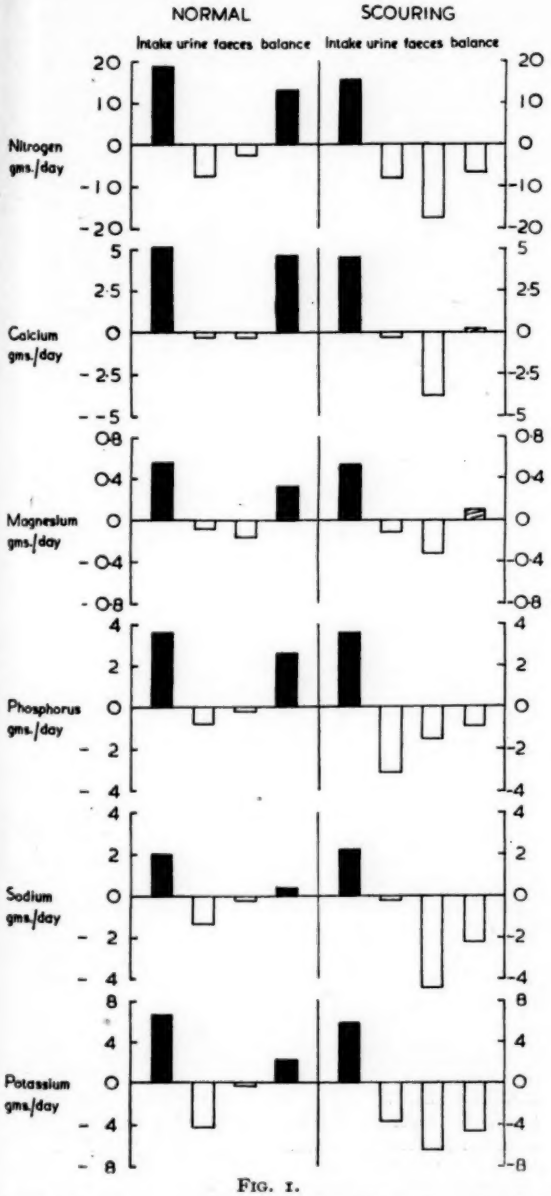

FIG. 1.

calves given the same ration and affected by severe diarrhoea lost 85 mg. equiv. The faecal losses in these two groups, however, were 7 and 139 mg. equiv. respectively. Compensation was thus not complete. From balance studies it may be calculated that the amounts of K and Na released from the breakdown of body cells during the "physiological starvation" (Blaxter & Wood, 1951a) of scouring are not sufficient to meet the faecal and urinary losses. The interpretation of the urinary volume during scouring is difficult since it has been shown in other experiments that heat production falls continuously during starvation and less water is vaporised from the skin and respiratory passages in consequence.

6. Interpretation of Metabolic Data

The above data suggest that scouring arises from a primary disfunction high in the intestinal tract, leading to undigested feed residues reaching the lower part of the intestine. A massive bacterial activity in that region which possibly spreads to higher levels of the tract leads to an increase in the number of smaller molecules such as steam volatile acid, thereby increasing osmotic activity in the lumen of the gut. An infiltration of water into the lumen in response to the high osmotic pressure necessarily takes place. This water infiltration is accompanied by electrolytes and finally the irritating watery mass is explosively discharged from the colon. Acid irritation of the mucosa, increased motor activity, loss of the protective mucus from the intestinal wall and partial invasion of the gut wall by bacteria are possibly contributing factors in the later stages, but are dependent on the primary fact that absorption in the small intestine is faulty, providing a suitable substrate in the lower part of the intestine, so that coliform and other bacteria normally inhabiting this region multiply prolifically. It is their metabolic products which induce these changes.

7. Scours Induced by Dietary Alterations Affecting Abomasal Digestion

The rapid passage of material through the abomasum, without a preliminary gastric digestion, would result in a high concentration of partially digested feed in the small intestine. Clot formation would thus seem important. Our experiments have shown that if clot formation is inhibited or excluded by the nature of the diet, then scouring inevitably follows. Thus, reduction of the casein content of liquid diets results in a fall in the digestibility of dietary fat and protein and severe uncontrollable scours (Blaxter & Wood, 1951b). Similarly, replacement of casein which forms a clot with rennet, by gelatine which does not, leads to profuse diarrhoea (Blaxter & Wood, 1952). Again, deliberate overloading of the abomasum by suddenly giving the whole daily allowance of food in one feed was found to induce scours in young calves where the capacity of the rumen which can act as a "milk reservoir" is small (Blaxter, Hutcheson, Robertson & Wilson, 1951). This overloading probably accounts for the high incidence of scours when pail feeding is adopted compared with natural suckling. In this regard it has been shown (Wise, Miller & Anderson, 1947) that chyme leaving the abomasum when milk is drunk from an open pail is not digested to the same extent as when it is given by suckling.

A further aspect concerns the nature of the clot and the dependence of the rennet clotting of casein on calcium ions, acidity and the inhibitory effect of salts of the alkali metals. In one series of experiments lowering the Ca content of an artificial diet from 110 to 80 mg. per 100 ml., thus increasing clotting time, resulted in scouring. Similarly Kastelic, Bentley & Phillips (1950) have shown that artificial milks which do not clot with rennet, either because of a low concentration of Ca or a high concentration of Na, also lead inevitably to scouring. It is of interest that many reconstituted milk powders do not clot with rennet, probably as a result of changes in the solubility and ionisation of the Ca, and that ability to clot is restored by the addition of a Ca salt. Acid clotting of milk as opposed to rennet clotting in the abomasum will undoubtedly give rise to a curd of low tension (Kugelmass, 1937) which is expelled into the duodenum before rennin action has taken place. The importance of this we have demonstrated by giving milks with the *p*H adjusted with acid to be close

to the isoelectric point of casein. These caused serious scouring.

It has been suggested by Sheehy (1934) that formation of very hard curds in the abomasum can lead to abomasal and duodenal irritation and hence to the rapid passage of subsequent meals, once again providing undigested feed materials in the lower part of the intestine. In general it appears that defective gastric or high intestinal digestion can be elicited by changes in the nature of the diet. Undoubtedly the " scour inducing properties " of the milk from individual cows and from the same cow at different times (Shanks, 1950; Inglis, 1952) can be explained on this basis.

Further evidence that scouring is associated with the presence of easily fermented material in the lower gut has been obtained in experiments in which glucose or lactose has been given to calves. The results in Fig. 2 show that as the dietary concentration of sugar is increased, so faecal loss (inversely proportional to the dry matter concentration) increases. Similar results with lactose have been obtained by Rojas, Schweigert & Rupel (1948). This is not a simple hydragogue action since no sugar can be detected in the fresh faeces; it can be explained on the basis of an increase in bacterial proliferation in the gut.

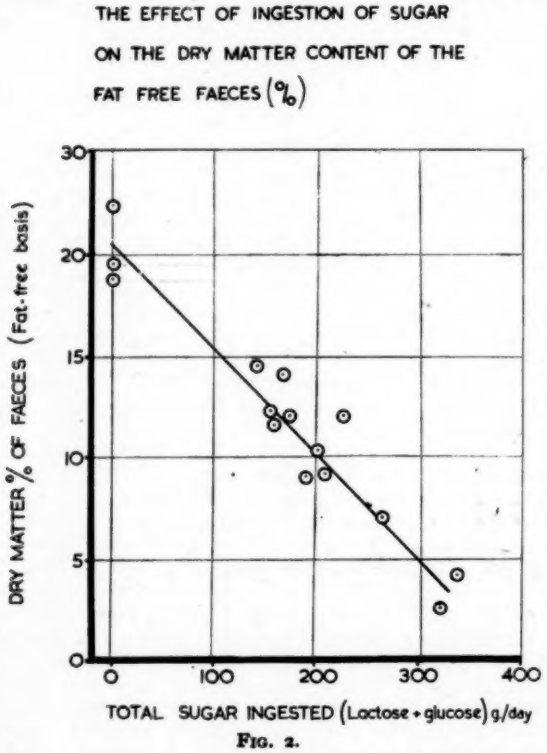

Fig. 2.

In some calves abomasal secretion of digestive juices may be at fault, but no information is yet available regarding the normal development of secretory function of the abomasum, still less of abnormal development.

Discussion

The evidence assembled above suggests that scouring of calves is associated with high intestinal tract failure, and that bacteria play a secondary rôle by multiplying in the unabsorbed material present in the gut, conditions there being favourable for their rapid growth. Probably in the diarrhoeas associated with certain systemic infections this sequence does not occur. It can, however, explain the diarrhoea which follows infestation of the gut with helminths or coccidia where damage is done to the mucosa, and therefore absorption is affected. For a wide range of scouring conditions such as we have met in experimental calves given rations of milk or rations closely simulating milk, it appears that the central feature is the abnormal presence of large amounts of fermentable materials in the lower third of the intestinal tract. It follows that there are two possible sequelae to the inception of scours. If strains of coliform organism against which the calf has no immunity multiply in the lower part of the gut, then tissue invasion follows and death results (Aschaffenburg *et al.*, 1951). It is possible that the survival of calves given no colostrum is due to the absence of favourable conditions for bacterial growth in the lower intestine rather than to some unknown and rapidly acquired natural resistance.

If the calf has an immunity against the particular bacterial strain or strains involved, tissue invasion may not take place. The bacteria increase in number, spreading higher and higher up the intestinal tract. The products of their metabolism are absorbed in part and are in part diluted by an inflow of water and electrolyte from the tissues. The consequent loss of unabsorbed food materials in the faeces is undoubtedly severe, but more serious is the depletion of electrolyte which may result in dehydration and death. In many instances, however, the whole sequence becomes a vicious circle in which additional amounts of the same food only serve to make matters worse. A common method of treatment which is well established is to stop this sequence by replacing milk with water, thus inhibiting bacterial growth; to restore hydration and to follow this by slow realimentation. Starvation of the calf leads, however, to very severe losses of body constituents, much more so than in the adult (Blaxter & Wood, 1951a), and this lack of resistance of the calf must be taken into account. The salient rôle played by Na and K loss during dehydration and by Ca in promoting clot formation should not be ignored in any veterinary treatment.

We are indebted to Mr. Grindley, M.R.C.V.S., for carrying out coliform counts and some of the *p*H determinations.

Summary

1. Information obtained incidental to metabolic experiments with calves has been summarised with reference to alimentary disturbances.

2. Data relating to the composition of faeces from normal and scouring animals are given together with data relating to bacterial numbers and the metabolic adjustments made by the scouring animals.

3. A number of experiments in which scouring has been induced are summarised.

4. The aetiology of scouring is discussed, and it is suggested that bacteria play a secondary rôle in its inception, but not necessarily in its ultimate outcome.

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THEILERIA MUTANS DETECTED IN BRITISH CATTLE

BY

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A number of observations on the reproduction of British redwater in cattle by syringe passage have been made on this Station. In one series an intraerythrocyte parasite indistinguishable from *Theileria mutans* has been detected, and apparently transmitted concurrently with *Babesia bovis*.

The original donor used in this series was purchased in Cornwall as having recovered from natural redwater without specific treatment. Following splenectomy this animal relapsed, typical *B. bovis* appearing in considerable numbers. Blood smears were examined daily over a period of 11 weeks but no parasite other than *B. bovis* was detected.

Six cattle were inoculated with blood withdrawn from this donor when babesia were plentiful. One had previously been injected with babesia-containing blood from another source and it showed no temperature reaction or infection on this occasion. The remaining five cattle, one of which had been splenectomised, all reacted typically, and in blood smears made daily for three weeks no parasite other than *B. bovis* was seen.

Six weeks after the injection of infected blood one of these cattle, Cow No. 5, was splenectomised. She relapsed as a typical case of redwater. Babesia appeared in the circulating blood four days after splenectomy and persisted for eight days. On the seventh day organisms were seen which differed morphologically from babesia. They were regularly present in small numbers until the observation was discontinued at the end of three weeks.

When Cow No. 5 was at the height of the post-splenectomy reaction to *B. bovis*, blood was withdrawn and injected into three cattle, one splenectomised. All reacted typically for redwater and later all showed the unusual parasite in blood smears. Since then 12 cattle have been used in further observations and in each this parasite has appeared. It has now been passaged five times in series.

This unusual parasite differs in several respects from *B. bovis*, which occurs chiefly as round or double pear-shaped forms which stain deeply by Giemsa's method (see Fig. 1); only very rarely does more than one parasite occupy one red cell. Babesia are first seen in blood smears four or five days after the injection of infected blood and are most numerous at about the eighth or ninth day. After about the 12th day babesia become very scanty and usually cannot be found in ordinary blood smears. At the time when they are most numerous in the circulating blood there is always pyrexia and often also haemolysis and clinical signs of redwater.

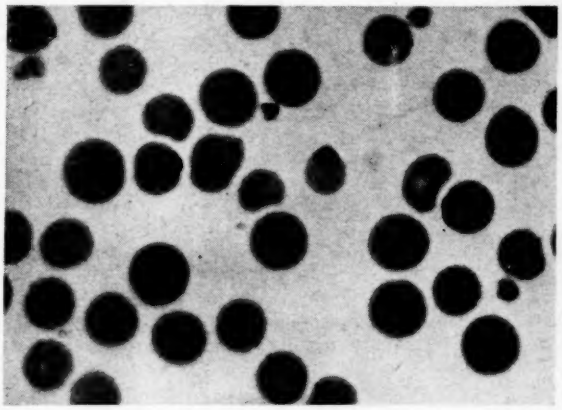

Fig. 1.—Typical *B. bovis* five days after the inoculation of infected blood.

The other parasite occurs in a variety of forms; round, elliptic, rod-shaped and flame-shaped. Bi-nucleate forms are not uncommon and some are seen with four nuclei, giving a characteristic " X " appearance. It tends to be smaller than *B. bovis*, often being only 1μ long, stains more faintly by Giemsa's method and two, three and four or more parasites are frequently seen in one red cell (see Figs. 2 and 3). In most cases it is first seen some days after the appearance of the babesia and the numbers present in the circulating blood increase over a period of six or eight weeks, being regularly present throughout this time and often for much longer periods. Its appearance and continued presence is not accompanied by any evidence of illness.

Dr. C. A. Hoare, F.R.S., The Wellcome Laboratories of Tropical Medicine, has kindly confirmed that this small parasite is morphologically indistinguishable from *T. mutans* and its other characteristics are in conformity with its being this organism.

Since this is the first recorded identification of *T. mutans* in British cattle, it is important to try to determine its natural source. All the cattle used in this work were born and reared in Britain. None had been deliberately exposed to infection from abroad and this also applies to all the cattle on the Station. The parasite was not seen in the blood of the original donor—the Cornwall heifer—either before or after splenectomy. It did not appear in five of the six cattle injected with blood from this animal. It seems reasonable to conclude that the Cornwall heifer was not carrying the parasite and that Cow No. 5 was not infected by the injection of blood from it.

T. mutans was first detected in the blood of Cow No. 5 —a cow born and reared on the Station. Daily blood smear examination has been practised in many instances, both before and after splenectomy, in pre-transmission observations on other similar cows. In no instance has the presence of this parasite been suspected. There is one special point

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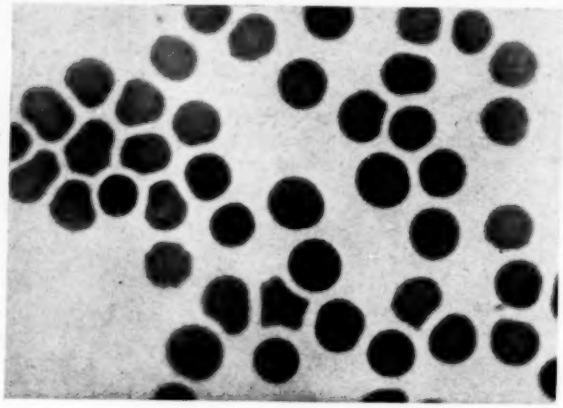

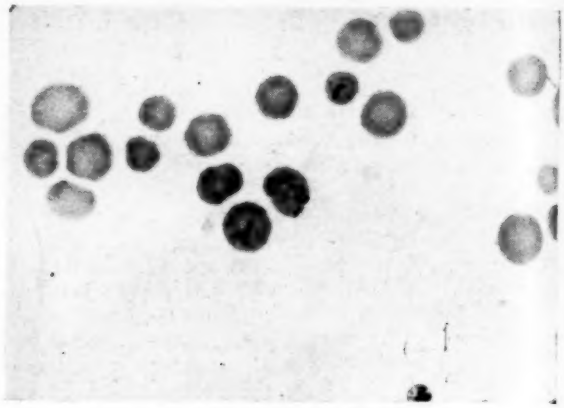

Figs. 2 and 3.—*T. mutans* in bovine blood 35 days after the inoculation of infected blood.

in the history of Cow No. 5. Nine months prior to the injection of blood from the Cornwall heifer she was injected with a suspension made by grinding, in sterile horse-serum broth, four ticks (*Ixodes ricinus*) removed from a clinical case of redwater in Hampshire. There was no evidence that babesia had been transmitted at this time. The typical response to the injection of redwater blood from the Cornwall donor supported this view, although, in the interval, the animal had been used in toxicity testing a babesiacide of known efficiency. There are, then, some grounds for suggesting that the source of infection was the injection of the tick suspension and the natural source an animal in Hampshire.

This first detection of *T. mutans* in British cattle occurred under circumstances which point to its being a natural parasite of the country.

Acknowledgments.—I wish to acknowledge my indebtedness to Dr. R. F. Montgomerie, and Mr. S. L. Hignett for their guidance and encouragement throughout the course of the work on which this note is based. I am grateful to Mr. G. N. Gould and Mr. S. C. Rickard who supplied material, and to Miss L. R. M. Anscombe and Miss B. O. Vidler who were responsible for the care of the experimental animals and for technical assistance.

Over three-tenths of cattle in Devon are in the county's 3,868 attested herds, the Superintendent Veterinary Officer for the South-West, Mr. G. Atkinson, told Devon Diseases of Animals Committee at Exeter.

In the attested herds were 140,183 animals, Mr. Atkinson said, or 34·7 per cent. of cattle in Devon.

There had been a marked increase in the numbers in the last five years. Though the national average of tuberculosis-free herds of 43·5 per cent. was higher than Devon's, the rate of increase in the county's percentage in the last few years was greater than the national increase.

* * * * *

In an effort to provide a useful service to the country's milk producing industry, the Scottish Milk Marketing Board is proposing to carry out a progeny test, under standard conditions, of heifers bred by a selection of Ayrshire bulls used at the artificial insemination centres operated by the Board. It is proposed that the test, carried out in conjunction with British Oil & Cake Mills (Ltd.), shall take place at the company's farm at South Cathkin, Rutherglen.

CLINICAL COMMUNICATION

TREATMENT OF TAPEWORM INFESTATION IN SHEEP

L. G. HARRIES, B.Sc., M.R.C.V.S.
Severn Stoke

References have been made in American veterinary literature [1, 2, 3, 4] to the value of 2:2′-dihydroxy-5:5′-dichlorodiphenyl methane* as an effective anthelmintic in lambs and sheep harbouring species of Moniezia and the fringed tapeworm, Thysanosoma. I note, however, that no case reports have been published in Britain on this subject and, because of my experience two years ago with this chemical compound in a heavy infestation of *Moniezia expansa* in both lambs and ewes on a well-run farm in Worcestershire, I believe that, although belated, this article may prove of help in substantiating American reports concerning the value of this agent. Although Moniezia infestation does not appear to be a very grave problem in Britain, I believe it is ever present in certain parts of the U.S.A., South Africa, New Zealand and Australia.

History.—For four months prior to the March lambing, several ewes in the flock were in poor condition. Because of a suspected nematode infestation, phenothiazine was given twice, with an interval of one month between, the second administration being in January. This did not help the condition of the ewes in any way and indeed, although weather conditions were favourable, 20 died in lambing. After lambing there were 250 ewes and 272 lambs, kept on 120 acres of low-lying land, on which also were 25 store cattle and two thoroughbreds. Within a few days after birth staggering occurred in the lambs and 27 died after a few days of illness. It was suspected that cobalt deficiency was the responsible factor, and a chemical mixture containing trace elements was employed. The 20 lambs treated with this all died of gastro-enteritis, and it has been shown since that the mixture was responsible for the deaths as the lambs were extremely young. The remaining lambs and ewes failed to make much progress and when I was called in during the first week of June,

* Available in Britain as "Dicestal" (May & Baker) and in America as "Di-phenthane-70."

faecal examinations disclosed a heavy infestation of Moniezia in both ewes and lambs. By the time it was determined that tapeworms might be the factors involved in the poor general condition some 10 weeks had elapsed since lambing and only 230 ewes and 220 lambs were left, with the mortality rate of the latter increasing during the second week of June, 10 having died.

Treatment.—After a discussion on appropriate therapeutic measures to be taken, I was able to obtain supplies of 2:2′-dihydroxy-5:5′-dichlorodiphenyl methane in two forms. The first, which was used in lambs, was the currently available 0·5 gramme tablet, as used as a taeniacide in dogs, and the second, for the ewes, was a 5 gramme tablet, which was specially made for this trial to simplify dosage. Unfortunately no controls could be kept because of the farmer's natural anxiety over the protracted nature of the condition and every ewe and lamb, numbering 450, was treated orally on the one day. The ewes were given $1\frac{1}{2} \times 5$ gramme tablets and the lambs $6 \times 0{\cdot}5$ gramme tablets, a dose comparable to that for dogs, namely, one 0·5 gramme tablet per 6 lb. bodyweight. When I walked round the field before driving the sheep in for treatment I found two lambs dead and several appeared to be dying. The two dead lambs were autopsied, as also was one which was obviously dying, and in one case 28 Moniezia were extracted and in the other two, impactions by tapeworms were observed.

Ryff *et al.* [1] reported that fasting prior to treatment enhanced the action in sheep but in this case, because of their general condition, no attempt was made to fast the animals. On the day after treatment four lambs died, but two of these had previously been observed to have an arthritic condition of the stifle joint and all four had been in very poor condition. After treatment, no further losses were encountered and a remarkably rapid increase in bodyweight and general condition was observed in the surviving lambs and ewes. As a matter of interest, the lambs were sold as store lambs in September and October and weighed 90 to 100 lb. live weight. The fact that the ewes had a heavy infestation of Moniezia surprised me but after treatment they, too, rapidly regained condition.

No sheep were raised on this farm during 1952 or 1953 and therefore, in this respect, together with the fact that no controls were kept, certain interesting data are missing.

Summary

Poor general condition and some mortality in both ewes and lambs in a sheep flock was due to a heavy infestation of Moniezia. 2:2′-dihydroxy-5:5′-dichlorodiphenyl methane was used for treatment of 230 ewes and 220 lambs. The ewe dose was $7\frac{1}{2}$ grammes and the lamb dose 3 grammes. Treatment was followed by rapid increase in bodyweight and general condition and though no controls were kept the drug is considered to have been responsible for the improvement.

Acknowledgment.—I wish to express my thanks to May & Baker, Ltd., Dagenham, for the supplies of "Dicestal" freely provided.

References

[1] Ryff *et al.* (1950). *J. Amer. vet. Med. Ass.* **117.** 471.
[2] Enzie *et al.* (1953). *Ibid.* **122.** 29.
[3] Price *et al.* (1953). *Ibid.* **122.** 216.
[4] Allen *et al.* (1953). *Vet. Med.* **48.** 352.

ABSTRACTS

Migration Route of Dictyocaulus Larvae to Lungs*

For the study of this problem the author examined both cattle naturally infected with lungworms and experimentally infected rabbits, guinea-pigs and mice. Two rabbits were given 10,000 infective larvae of *Dictyocaulus filaria* and two were given 10,000 infective larvae of *D. viviparus*. Fourteen guinea-pigs aged six to seven weeks were given 7,000 infective larvae of *D. filaria* and 20 more were given 7,000 infective larvae of *D. viviparus*. Twenty mice aged six to seven weeks were given 3,000 infective larvae of *D. filaria* and 10 more were given 3,000 larvae of *D. viviparus*.

The possibility of pre-natal infection was checked by examination of 26 foetuses and two calves, 10 and 35 days old respectively, all of which were the offspring of cows suffering from parasitic bronchitis. No evidence of lungworm infestation could be found in any of these. In 60 samples of faeces collected from heifers born while their dams had parasitic bronchitis no larvae of *D. viviparus* were found. The author concludes that pre-natal infection is rare. He refers to the work of Kasparek, T. (1900. *Arch. wiss prakt. Tierheilk.* **26.** 70), who recorded pre-natal infection of calves one and a half to eight days old, and Neveu-Lemaire, M. (1912. *C. R. Acad. Sci., Paris* **154.** 1311), who recorded finding adult *D. filaria* in a foetus *in utero* and in a lamb four days old. The author regards these as being accidental infections. Porter, D. A., & Cauthen, G. E. (1942. *Amer. J. vet. Res.* **3.** 395), failed to establish infection experimentally.

Larvae of *D. viviparus* were not found by Soliman in any of 17 livers of cattle suffering from parasitic bronchitis; but in one only of the guinea-pigs experimentally infected with larvae of *D. filaria*, two fourth-stage larvae of this species were found in the liver 20 days after infection. The author states that this confirms the view of Kauzal, G. P. (1933. *Austr. vet. J.* **9.** 20), that the larvae may get accidentally into the portal circulation, Kauzal having found larvae of *D. filaria* in the liver of a guinea-pig experimentally infected, although he did not find larvae in the livers of lambs nor did he find the larvae of *D. viviparus* in the livers of cattle during the early stages of parasitic bronchitis.

In the mesenteric glands, on the other hand, of the cattle naturally infected and examined by Soliman, larvae of *D. viviparus* were found. They were also found in the mesenteric glands of the rabbits, guinea-pigs and mice experimentally infected. They were in the mesenteric glands 24 hours after infection and active third-stage larvae were passing through these glands during the first five to six days after infection. The larvae were in the lungs on the third day after infection. By the sixth day the larvae had become fourth-stage larvae and the sexes were then clearly differentiated. Fifth-stage larvae [young adults] were first found 14 days after infection. After 22 days the females showed the vulvar opening and the spicules of the males were of normal size. In the experimental animals the pneumonic lesions were in the situations they occupy in cattle.

The author's work thus confirms the view that the larvae of these lungworms normally pass by way of the mesenteric glands and lymphatic system to the blood and then go on to the lungs and that the liver and the foetus *in utero* are only occasionally infected by aberrant larvae which get into the blood. G. L.

*Migration Route of *D. viviparus* and *D. filaria* Infective Larvae to the Lungs. Soliman, K. N. (1953). *J. comp. Path.* **63.** 75-84.

Rearing Dairy Stock*

This article is based on a paper read by Dr. Arthur Hansson, of the Animal Breeding Institute, Wiad Edltomta, Sweden, before the British Cattle Breeders Club Conference. It summarises in readable form some of the research on identical heifer twins that has been in progress since 1941 and which is already giving results of profound significance not only to cattle-rearing but also to the science of nutrition in general. As a result of these studies our concepts of the correct method of rearing heifer calves may well be changed.

At the onset it was believed that a relatively high plane of nutrition was necessary to produce satisfactory body development, fertility, milk production and longevity. Accordingly, four different groups of heifers were reared on rations providing 60, 80, 120 and 140 per cent. respectively of the recommended Scandinavian feeding standard. The actual consumption of feed varied from these percentages owing to refusals at the higher levels.

During the first six months of life a high plane of nutrition increased growth considerably. The individual heifer has a high growth potential and can develop quickly if it receives enough nutrients.

During the second six months growth continued to be enhanced by high-level feeding, but not to such a marked degree. It would appear, therefore, that it is possible during the first six months to use up a considerable proportion of the " growing capacity."

During the third six months growth reached a maximum at normal feeding intensity and then decreased when the plane of nutrition was raised further. The high-plane animals use up so much of their growing capacity in the early stages that they are apparently unable to grow as quickly as the normally fed animals.

During the fourth six months the tendency was largely the same as in the third. In the case of low-plane animals, however, growth between 18 and 22 months of age was extremely low since they were in-calf and were not receiving any additional feed for pregnancy.

Continued studies up to maturity indicate that the intensity of feeding, within the limits adopted for these experiments, is practically without influence on adult body development. Thus any advantage from a high plane of nutrition is lost subsequently.

It is suggested that since rearing intensity primarily influences the rate at which an individual develops, and as there is a strong negative correlation between rate of development and life-span, rearing intensity must also have a large influence on longevity. This aspect is dealt with elsewhere.

From the practical standpoint the most surprising and significant findings are those relating to milk production. Both actually and relatively the highest yields were obtained from the twins reared on the lowest plane of nutrition and the lowest yield from the twins reared on the highest level. " On the whole there is a tendency to decreased yielding ability with increased rearing intensity."

Two explanations are offered for these results. In the first place, the heifers reared on a low plane have a more efficient growth, and this tendency may persist. Secondly, the level of nutrition in these experiments was changed for all animals prior to calving and the additional nutrients available may have been more readily available to the low-plane animals and with particular benefit to the mammary tissues.

A. N. W.

* **Rearing Dairy Stock. I. Rearing Dairy Heifers.** Hansson, A. (1952). *Jersey Cow*. No. 36. 26-32.

Perineal Hernia*

In the opinion of the author the occurrence of perineal hernia is consequent upon rupture of the M. levator ani (retractor ani muscle). This muscle arises in a fan-shaped manner from the pelvis and is inserted into the anal sphincter, thus separating the abdominal cavity from the perineal region. It is a thin muscle, except in the bitch, where it is more powerfully formed and for this reason perineal hernia occurs only in the male. It is suggested that the occurrence of the condition in the old dog is due partly to progressive atrophy of the muscle and partly to straining associated with bony faeces resulting from gastric achylia. Enlargement of the prostate gland may play a predisposing part, but in the experience of the author this condition is only occasionally associated with perineal hernia. The operative correction of the condition is described in general terms only. Under butalgin narcosis and epidural anaesthesia (in view of the patient's advanced age) the edge of the external anal sphincter is separated and sutured to coccygeal muscle, sacrosciatic ligament, and tuber ischii, employing stainless or nylon sutures. The author records 14 successful results out of a total of 17 dogs operated upon.

S. W. D.

* **Perineal Hernia.** Moltzen-Nielsen, H. (1953). Proc. XVth Int. Vet. Congress, Stockholm. 1. 971-975.

REVIEW

[Veterinary Drug Encyclopedia and Therapeutic Index. H. C. Stephenson and S. G. Mittelstaedt (1953). Drug Publications, Inc., N.Y. Pp. vii—141. Price not stated.]

This publication might fairly be described as a universal catalogue of the products of those firms in the United States who handle drugs, foods and biological products for veterinary use. Not all such firms have contributed to its production. Very many of the products listed are not available in this country and many in regular use here are not mentioned. Even in the case of the products of houses with British connections the products listed differ from those marketed on this side of the Atlantic.

The therapeutic index is very incomplete and sadly lacking in uniformity of arrangement.

While this production may be of service in the country of its publication, it can be of little or no use to the veterinary profession in this country.

TUBERCULOSIS ERADICATON PLAN FOR EIRE

The Irish Government plans to launch a scheme to rid the Republic of cattle suffering from tuberculosis. Clare has been selected as the first TT county area, as movement of cattle into the county is not extensive.

This tuberculosis eradication plan is being speeded up by the Ministry of Agriculture because of the insistence of British importers on tuberculin tests in respect of Irish cattle. Cattle exporters believe that the imposition of a ban on the importation of cattle which have not passed a tuberculin test is at present under consideration in Britain.

QUARTERLY MEETING OF COUNCIL, B.V.A.

SUMMARY OF PROCEEDINGS

Under its newly-elected President, Mr. Alex. Thomson, of Glasgow, the large volume of business requiring attention at the autumn meeting of the Council of the Association was dealt with expeditiously at the Connaught Rooms, W.C.2, on Friday, November 13th, 1953.

The preliminaries to the presentation of the records of committee business were brief. They included grateful acknowledgment by Mr. G. H. Locke, of Manchester, of the bestowal upon him at Aberdeen of honorary life membership of the Association, and a moving tribute to the late Mr. Arthur Watson, by a fellow member of the Bradford partnership, Mr. A. J. Adams, who spoke with sorrow of the severance of one more link with " the golden age of the horse." The gratification with which Council received the Secretary's intimation that the Association had achieved a membership exceeding 4,000 was tempered by the knowledge that the roll of 4,020 included the names of over 50 members whose names would be removed from the Association's register unless their subscriptions for 1953 were received by the end of the year.

The Association's Parliamentary Bill

Much pleasure was afforded by the President's intimation that Viscountess Davidson, who had drawn second place in the ballot for the presentation of Private Members' Bills, had taken under her aegis that promoted by the Association—its first—to extend the scope of anaesthesia for animals and to allow the veterinary surgeon full discretion in his choice of agent. This of course holds out splendid promise of further and early advancement of a measure which otherwise, despite the valued efforts of its promoter, Lord Stamp, would appear to have reached something of a " dead end " following its Second Reading in the House of Lords, where it met with the support of all parties.

The committee concerned with this matter—the Parliamentary and Public Relations—had further encouragement to give to Council, after a period of disappointment in the matter, in the intimation that certain important agricultural societies were now to insert in the prize list for the horse section of their shows, a new regulation precluding the exhibition of any docked or nicked horses other than those on which the operation was performed for veterinary reasons.

Meat Inspection

As was evidenced at Aberdeen, the necessity for veterinary supervision of the inspection of home-produced meat has for long been a major concern of the Association. The recommendation to Council, made by the Veterinary State Medicine Committee, was accepted, that there be adopted the new B.V.A. Memorandum on Meat Inspection and Control, prepared by the Sub-committee responsible for its revision. This document, to be published with the full report of this meeting of Council in due course, furnishes full evidence in support of its main submission, that the existing organisation of the Animal Health Division of the Ministry of Agriculture makes it a suitable foundation upon which the new service envisaged therein could be built. The committee's recommendation that an approach be made to the Ministries of Agriculture, Food and Health, on the basis of this memorandum, was accepted by Council as a first step.

A resolution had reached this committee from the Society of Practising Veterinary Surgeons requesting the Association to enquire of the Ministry of Agriculture what is to be its future policy in relation to the tuberculin testing and other work it delegates to Local Veterinary Inspectors, in view of accumulating evidence of diminution or suspension of these duties. This is now such an important feature of the veterinary surgeon's work, more particularly in rural areas, that many gear the organisation of their practices upon its requirements. It was left to the officers of the Association to discuss this matter informally with the C.V.O. and report to the next meeting.

" Guide " or " Bond " ?

Council was interested to learn from its Organising Committee that the way is now clear for formal discussions of the recommendations in the report of the Champion Committee on Licences under Section 7 of the Veterinary Surgeons Act, 1948. It appears from the report of this committee, supplemented by remarks made in Council, that instances are occurring in which former principals are suffering for placing reliance upon the admonitions contained in the " Guide to Professional Conduct " in preference to the old-fashioned " bond." Details of specific cases of squatting by former assistants are to be requested from the East Midlands Division (which raised the matter on resolution); these could then be discussed and, if thought fit, passed to the R.C.V.S. on principle.

Members were pleased to note, in connection with the B.V.A./R.S.P.C.A. Joint Free Veterinary Advice and Treatment Schemes, that, firstly, every proposal for the establishment of a new clinic is subjected to the closest examination in conjunction with the local veterinary surgeons and, secondly, that wherever a clinic is in operation a firm stand is taken for the establishment of a clinic committee.

Appointments with Local Authorities

The Home Appointments Committee is a most valuable link in the Association's organisation for safeguarding the interests of its members. The existing B.V.A. recommended scale of salaries for appointments as veterinary officers with local authorities is to be scrapped and until the time is opportune for the formulation of a revised scale, enquiries for a recommended scale received at Headquarters should receive the reply that the range of salaries for local authority veterinary officers should be at least comparable with that paid to the various grades of Ministry of Agriculture veterinary officers at the time of the enquiry. The " at least," it may be mentioned, was an inclusion demanded by Council on being reminded that the Association is far from satisfied with the Ministry's scale.

The argument having gained the day that the existence and labours of an Executive Committee reduced the status of the Main Committee to that of a " rubber stamp," the Editorial Committee is to revert to the former system of meeting as a full committee once a month. A number of projects, involving modest expenditure within the authority of this committee, are in hand for the provision of fresh material for several sections of the Association's journal. The co-operation of the Royal College is to be sought in enabling the Association's reporter to provide more adequate accounts of the proceedings of the Council of the Governing Body of the profession.

The Association's New Premises

The report of the General Purposes and Finance Committee represented, as always, a veritable "mixed bag." Outstanding among its contents was an extended reference to the minutes of the Premises Sub-committee still toiling amidst the host of legal, constructional, and other complexities consequent upon the acquirement of our fine new premises. Marked progress is being made, however, in the physical process of preparing this accommodation, and after congratulating the sub-committee on the terms of the agreement made with London University for the surrender of the lease of 36, Gordon Square, Council complied with alacrity with the President's request for suggestions for the ceremonial opening of our new home, to which momentous step forward in the affairs of the Association he referred as a milestone in its history. In the light of these circumstances, indeed, an element of romance accompanied his otherwise prosaic concluding intimation that "our next series of committee meetings will take place at 7, Mansfield Street."

Meanwhile, Council had enjoyed a number of refreshingly-phrased and informative reports from Presidents, past and present, and others on visits paid on the Association's behalf to the International and other Congresses and meetings at home and abroad. One such forthcoming event cast its shadow before: the view was upheld that the universally admitted necessity for stronger representation at the Veterinary Hygiene Section of the Royal Sanitary Institute's important annual congress can best be achieved through the efforts of the local B.V.A. Division, but it was evident that some of our delegates to earlier congresses remain convinced that additional representation from Council is imperative.

IN PARLIAMENT

Protection of Birds Bill

In the House of Commons on Friday of last week Lady Tweedsmuir readily secured a second reading for her Protection of Birds Bill which, she said, was similar to a Bill presented recently in the House of Lords. If her Bill was accepted, she understood that the Bill introduced in the Lords would be withdrawn. This Bill replaced the existing Bird Protection Acts, of which there were 26, some dating back to the early years of George the Third, and also over 250 regulations. It was the result of a great deal of work by two advisory committees, and discussions had ranged over some five years. Its principle was to give comprehensive protection to wild birds and their eggs, with some exceptions. Many birds of the more common variety were able to hold their own against an expedition against them, and the professional collector was not much interested in common birds. As a rule, children did not come upon the rare species, and there was no desire to prevent children taking part in the exciting pleasure of bird-nesting. Standing in the path of the northern migrations the country had the important task of taking a lead in our bird protection laws. This would be an encouragement to other countries to take similar action.

Major Beamish said that one of the main criticisms of the present law was that the penalties for breaking it were no deterrent. Recent convictions had shown what a strange muddle the law was in. For killing one of our rarest visitors, the hoopoe, someone was fined only 10s. But another person was fined £1 for killing a seagull. Prices for eggs were high, and he had been astonished to find that one dealer had been selling between 20,000 and 25,000 lapwing eggs in one year, mostly to children, at 6d. each. That was something which this Bill would stop.

A further criticism was that rare bird visitors to these shores were not protected at all under existing legislation. Moreover, there was a kind of person who, directly he saw a bird he did not recognise, wished to shoot it. There was a real need for legislation. He was doubtful whether, for the kind of hardened criminal who went out with the specific object of shooting rare birds, the £25 fine was sufficient.

Government Support

After debate, in which the view was expressed that there was need to create in the younger generation a respect and affection for bird life—a matter in which the Press and the schools could help—Sir Hugh Lucas-Tooth, Under-Secretary, Home Office, said that a new Act on this subject was badly needed. The Government would have been glad to have introduced such a Bill had parliamentary time permitted.

Strong arguments had been advanced for comprehensive protection for eggs, but the Government thought the objections to the prohibition of bird-nesting were insuperable. It was hard to justify creating an offence, the main impact of which would be essentially on children, especially when the activities concerned were as harmless as bird-nesting. Many people considered that such a prohibition would be unnecessary and crankish in itself. The protection of eggs was advocated to meet two sorts of mischief: the depredations of collectors of rareties and the depredations of hooligans. The Bill imposed effective penalties for the taking of rare eggs but the activities of hooligans could best be corrected outside the scope of the Bill, without resort to the criminal law.

The Government believed that there should be a simple list of familiar birds whose eggs were not protected and, if the Bill became law, the Home Secretary would prepare such a list, in conjunction with the advisory committees, to which the Nature Conservancy, set up under the National Parks Act, would be invited to appoint joint secretaries.

The Government gave full support to the Bill as it stood, but they opposed any question of the general prohibition of bird-nesting, and thought it essential to safeguard the interests of agriculture and sportsmen.

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Questions

Myxomatosis, Wales

Mr. Llewellyn (December 2nd) asked the Minister of Agriculture what sample tests are being taken in Welsh counties to ascertain the incidence of myxomatosis among rabbits.

Sir T. Dugdale: None. There is at present no evidence of myxomatosis among rabbits in Wales, but the Ministry's veterinary officers and county agricultural executive committees' staffs are on the alert. A suspected case was reported from Wales, but veterinary investigation showed that the rabbits had not died from myxomatosis.

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Slaughterhouses

Mr. Peyton (December 2nd) asked the Minister of Food how many additional slaughterhouses will, according to his present estimate, be required, following the derationing of meat in 1954; and what arrangements are being made to provide them.

Major Lloyd George: I am discussing this matter with the trades and organisations concerned. In the meantime, I would prefer to make no estimate.

Mr. Peyton: Will my right hon. and gallant Friend bear in mind that this is becoming a matter of increasing urgency and is arousing considerable anxiety in the country? Will he do his best at the earliest possible moment to make clear the expectations of the Government on this matter?

Major Lloyd George: My hon. Friend probably remembers that some months ago I appointed an inter-Departmental Committee to look into this matter very carefully. He will appreciate that this is a very big matter and affects many parts of the country. It cannot be settled quickly, but I hope shortly to get the report.

Mr. Hurd asked the Minister of Food what steps are being taken to make available sufficient slaughterhouse capacity to enable a start to be made next summer with the grade and deadweight system of marketing fatstock as desired by the National Farmers' Union.

Major Lloyd George: A producers' marketing board set up to undertake on a voluntary basis the slaughter of fatstock and the sale of meat by grade and deadweight would be responsible for securing the necessary facilities by arrangement with public and private owners of slaughterhouses. Such a marketing scheme could also provide for slaughterhouses to be built or acquired for the Board's exclusive use, subject, of course, to the law governing the matter.

Mr. Hurd: Does my right hon. and gallant Friend recognise that at least 20 modern slaughterhouses will be needed up and down the country by next summer to give this grade and deadweight scheme a fair start? Will he earmark some, if not all, of the new Government slaughterhouses for this purpose?

Major Lloyd George: I cannot agree to earmarking, because, as my hon. Friend probably knows, the slaughterhouses owned by the Government have already been offered to local authorities. But certainly I shall do everything I can to assist in any way, and perhaps we will be in a better position after we received the report of the inter-Departmental Committee.

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Sir I. Fraser (December 2nd) asked the Minister of Food if he will make a statement as to the Government's intention with regard to the recommendations given by the committee on the slaughter of horses.

The Minister of Food (Major Lloyd George): I would refer my hon. Friend to the reply given on November 25th to my hon. Friend the Member for Finchley (Sir J. Crowder).

Sir I. Fraser: I have not access to that reply at the moment. Did it indicate any progress?

Major Lloyd George: For my hon. Friend's information, I will quote it briefly. I said that my right hon. Friend the Secretary of State for Scotland and I were indebted to the hon. Member for Oldbury and Halesowen (Mr. Moyle) for bringing forward the Slaughter of Animals (Amendment) Bill to implement the recommendations of the committee, and that the Government intended to support and facilitate its passage through Parliament.

Mr. A. Henderson asked the Ministry of Food what steps he is taking to prevent the bleeding of horses, by means of an electric pump, in slaughterhouses.

Major Lloyd George: The use of an electric pump is prohibited by the Slaughter of Animals Act, 1933, unless the animal is first rendered insensible to pain. Both that Act and the Protection of Animals Act, 1911, apply to horses.

Mr. Henderson: Has the attention of the Minister been drawn to a recent issue of the *Daily Mirror* reporting a B.B.C. broadcast entitled "Horses Can't Talk," which described this revolting practice in operations taking place in a slaughterhouse not very far from here; and could the Minister say whether it is possible to take any steps to check up on this kind of statement and allegation?

Major Lloyd George: As the right hon. and learned Gentleman knows, there is a Private Member's Bill, which has the Government's support, to implement most of the recommendations of the Northumberland Committee. I think that, perhaps, we had better wait until that Bill comes forward. On the specific point raised, I do not think I can do better than quote from this report itself, which says:

"We have made the most diligent enquiries both in the Committee and of individuals, but have found no evidence of the use of an electric pump."

Mr. Henderson: Would not the Minister make enquiries through his Department of the B.B.C. as to what basis they have for making these statements?

Major Lloyd George: I will certainly do that.

Mr. Godfrey Nicholson: Is not the Minister aware of the public uneasiness which has been caused, and cannot he make some statement to allay that uneasiness, either by saying that he is quite satisfied that the practice does not exist, or that he will make diligent enquiries to see that it is stopped?

Major Lloyd George: I think my hon. Friend will appreciate that it was because of public anxiety that the Northumberland Committee was set up. As soon as the report of the Committee was received, it was accepted with two very minor modifications, by the Government, and, thanks to the co-operation of the hon. Member for Oldbury and Halesowen (Mr. Moyle) and his hon. Friends, we shall be able to get a Bill through Parliament early next year.

Dr. Summerskill: Could the right hon. and gallant Gentleman say how these horses are rendered insensible to pain?

Major Lloyd George: In the ordinary slaughtering practice, horses and other animals are stunned first, and that, in fact, is the law. What we are trying to stop are cases in which stunning does not take place first.

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Imported Dogs (Quarantine)

Sir I. Fraser (December 3rd) asked the Minister of Agriculture if he will consider relaxing the quarantine Regulations applicable to imported dogs if evidence can be produced that they have been effectively inoculated.

The Minister of Agriculture and Fisheries (Sir Thomas Dugdale): No, Sir. Inoculation cannot be relied on to give complete protection against the spread of rabies.

Sir I. Fraser: Will my right hon. Friend watch this matter, because it would obviously save a good deal of money and trouble if we could find a means to deal with this troublesome quarantine position?

Sir T. Dugdale: Yes, Sir, I will, but after the experience of 30 years it is proved that this country is far in advance of any other country in this respect.

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Sheep (Braxy Disease)

Mr. Crouch (December 3rd) asked the Minister of Agriculture if he can make a statement on recent research into braxy disease of sheep.

Sir T. Dugdale: Very full information about this disease and its prevention is already available and I do not know of any recent research. I am sending my hon. Friend a leaflet about the disease, issued by my Department.

Mr. Crouch: Can my right hon. Friend say whether this is an infectious or contagious disease, or one which suddenly occurs?

Sir T. Dugdale: I am advised that this disease is neither infectious nor contagious.

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Fatstock Marketing

Mr. Bullard (December 3rd) asked the Minister of Food which trade and professional organisations he is consulting about the arrangements for grading and marketing fatstock under the scheme outlined in the White Paper, Command No. 8989; and when he expects to be able to announce details of these arrangements.

Major Lloyd George: The following is a list of the professional and trade organisations to which the Government is turning for advice. These bodies and any others which have an interest will be consulted freely as occasion requires.

The Joint English and Scottish Livestock Auctioneers' Consultative Committee.
The National Farmers' Union of England and Wales.
The Scottish Farmers' Union.
The Ulster Farmers' Union.
The National Council of Associations of Fresh Meat Wholesalers.
The National Federation of Meat Traders' Associations.
The Scottish Federation of Meat Traders' Associations.
The Association of Multiple Retail Meat Traders.
The Livestock Traders' Association of Great Britain.
The Parliamentary Committee of the Co-operative Congress.
The Trades Union Congress.

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Weekly Wisdom

All good thinking is fundamental thinking: every technical field, if it is boldly conceived, sets problems as radical as those of nuclear physics and the virus diseases.—J. Bronowski.

NOTES AND NEWS

BRITISH VETERINARY ASSOCIATION

CHANGE OF ADDRESS

MEMBERS, OTHER READERS AND ADVERTISERS
are requested to note that
ON AND AFTER FRIDAY, DECEMBER 18th
the
ADDRESS OF THE BRITISH VETERINARY ASSOCIATION
will be

7, MANSFIELD STREET, PORTLAND PLACE, LONDON, W.1.

Telephone number: Museum 6541

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Diary of Events

Dec. 12th.—Meeting of the Biochemical Society, in the London Hospital Medical College, Turner Street, E.1, 11 a.m.

Dec. 15th.—Royal College of Surgeons of England: Imperial Cancer Research Fund Lecture by Dr. C. le Q. Darcel, M.R.C.V.S., at 3.45 p.m., on "The Comparative Pathology of Leukotic Conditions in Man and Fowl."

Dec. 16th.—Meeting of the Section of Comparative Medicine, Royal Society of Medicine, to be held jointly with the Section of Ophthalmology, at 1, Wimpole Street, W.1, 5 p.m.

Dec. 16th.—Meeting of the Royal Microscopical Society at Tavistock House South, Tavistock Square, W.C.1 (Dr. R. W. G. Wyckoff, HON. F.R.C.V.S.,: "The Electron Microscopy of Viruses"), 5 p.m.

Dec. 17th.—Annual Dance, Dumfries and Galloway Branch of the V.Y.B.F. Ladies' Guild, at the Cairndale Hotel, Dumfries.

Dec. 18th.—Meeting of the Midland Counties Division, B.V.A., at the Birmingham Medical Institute, 154, Great Charles Street, 2.30 p.m.

Dec. 18th.—Meeting of the Sussex Division, B.V.A., at Brighton (Old Ship Hotel), 2.30 p.m.

Jan. 6th.—Meeting of the Association of Veterinary Teachers and Research Workers, at the Royal (Dick) School of Veterinary Studies, Edinburgh, 10 a.m.

R.C.V.S. Membership Examinations

Dec. 14th.—M.R.C.V.S. Oral and Practicals commence (Panels "A" and "B").

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Change of Date of Next Meetings of Council and Committees, B.V.A.

Owing to the fact that headquarters will be moving to 7, Mansfield Street just before Christmas the meetings fixed for early January (6th, 7th and 8th) have now been postponed until Wednesday, Thursday and Friday, January 20th, 21st and 22nd, 1954.

PERSONAL

Professor C. A. McGaughey's Appointment

Mr. C. A. McGaughey, Professor of Veterinary Science, University of Ceylon, has been appointed Dean of the Joint Faculty of Agriculture and Veterinary Science. He has also been elected President of the Ceylon Association for the Advancement of Science for 1955. The Association has a membership of almost 1,000 and comprises the following sections: Medical and Veterinary Science, Agriculture and Forestry, Engineering, Natural Sciences, Physical Sciences, Social Sciences. Mr. C. A. McGaughey is the first European to be elected to either of these offices.

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Veterinary Field Staff.—The following promotions have been announced: Mr. D. M. McIntyre, M.R.C.V.S., Veterinary Officer, has been transferred from Cupar to London Quarantine Station as Divisional Veterinary Officer, and Mr. A. W. Smith, M.R.C.V.S., Veterinary Officer, will be transferred from Reading to Head Office, Tolworth, as Divisional Veterinary Officer on December 21st, 1953.

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Births.—Carmichael.—On November 30th, 1953, at Tigh A'Bhet, Fort William, Inverness-shire, to Nancy, wife of M. A. Carmichael, B.Sc., M.R.C.V.S., a daughter.

Wyllie.—On December 3rd, 1953, to Audrey Wyllie, M.R.C.V.S. (*née* Sutherland), wife of Donald Wyllie, a daughter—Gillian Mary.

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Marriage.—Box—Gilbert.—On November 28th, 1953, at Purley Baptist Church, Philip George Box, M.R.C.V.S., elder son of Mrs. W. Box, of Sawbridgeworth, Herts, to Paula Constance Gilbert, S.R.N., only daughter of Mrs. E. Gilbert, of Wallington, Surrey.

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Deaths.—Dunbar.—On December 4th, 1953, Jane, aged 10 weeks, the beloved baby daughter of Gordon and Pamela, Eccleshall, Stafford.

Swaby.—Their many friends in the profession will be grieved to learn that Mrs. R. Swaby, of 8, Moston Terrace, Gainsborough, passed away on Saturday last after a short illness and an operation which, sad to say, revealed an irremediable condition. Mrs. Swaby was very well known to the profession, having attended the Annual Congress with her husband for many years. Mr. Swaby, with whom deepest sympathy will be felt, writes that "she thoroughly enjoyed the Aberdeen Congress and thought it one of the best. Mrs. Glover had enrolled her in the Ladies' Guild this year there, too." She was the niece of a veterinary surgeon, the late James Arnall, who practised in Brigg, Lincolnshire, over 50 years ago.

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R.C.V.S. OBITUARY

Danks, William Barr Cleland, B.Sc., M.R.C.V.S., Morini, Box 3904, Nairobi, Kenya, Africa. Graduated Edinburgh, July 19th, 1926. Died October 6th, 1953.

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The Late R. C. Bickerton, M.R.C.V.S., of Grange-over-Sands

A Personal Tribute

W. S. writes: By the death of R. C. Bickerton the farming community in the Lake District has lost a valued friend and adviser, and the veterinary profession is the poorer for his passing.

Qualifying in Glasgow in 1903 Roy Bickerton worked as an assistant in Kendal and Newtown (Montgomery) and settled at Bishops Castle, Shropshire, in 1908, where he remained until 1919 with the exception of the years 1915 to 1918, when he saw service in France as a Captain in the R.A.V.C., and was mentioned in despatches. Purchasing his previous employer's practice in Kendal in 1919 he remained there until 1946, when trouble with his eyesight forced him to accept the fact that the years were taking their toll and he moved to Grange-over-Sands where his death occurred on November 29th.

I was fortunate enough to go to him as an assistant in 1925 and during the next two years, apart from the fact that he

gave me so liberally of his experience, Mrs. Bickerton and he treated me more like an elder son than an assistant. The friendship formed at that time has remained until now, and when I was present at the simple funeral service in Grange Parish Church on December 2nd and saw "Bick" laid to rest in the presence of his family, I thought how truly Roy Bickerton represented all that was best in what we describe in the profession as a "country practitioner."

The horse was always his first choice as a patient; as a clinician his attention to detail was justified by the results he obtained. Obstetrics always ranked high with him, and I have heard it said in the broad dialect of Westmorland, "Sithee, Maister, if Mr. Bickerton canna calve 'er, 'er canna *be* calved."

He was blessed with a sense of humour; he could be very caustic—but without malice and always deserved—and he always had the interests of his profession in the forefront of a very able and receptive mind.

The sympathy of all his friends, within and without the profession, will be extended to his widow, to his son (who, forswearing the profession of his father, is now an orthopaedic surgeon) and to his two daughters.

May he rest in peace.

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Mr. William Barr Cleland Danks, B.Sc., M.R.C.V.S.

An Appreciation

R. A. H. writes: There are many in Kenya who will be grieved at the passing of Bill Danks, who was widely known throughout the colony.

Born at Ashgill in Lanarkshire in 1900, he was educated at Hamilton Academy and passed into Sandhurst in 1917. After service with the 3/6 Dragoon Guards (Carabineers) he resigned his commission in 1922 and entered Edinburgh University and the Royal (Dick) Veterinary College. At the University he excelled as a footballer and boxer, gaining a double Blue and holding the Inter-University and East of Scotland amateur welter-weight championship.

He joined the Kenya Veterinary Department in 1927 and for many years was prominent in local association football circles. In 1930, as a result of his original work on East Coast fever and undulant fever he was awarded a Rockefeller Fellowship in America; on his return he was elected an honorary member of the Kenya branch of the British Medical Association.

While in the Veterinary Department, Bill served in Nanyuki, Lumbwa and Kabete; farmers throughout the country will remember him as a good friend and a good veterinary surgeon, with a flair for rapid and accurate diagnosis.

He retired from Government service in 1950 and established a practice in Lower Kabete. Despite poor health during the past year, he worked hard until the end came suddenly on the morning of October 6th. Many of his friends attended the funeral at St. Mary's Church, Kabete. We are all the poorer for his passing, for he served his country well.

He leaves a widow and three daughters, to whom our deep sympathy is extended in their loss.

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Death of Professor E. Leclainche

Our readers will learn with profound regret that Professor C. Bressou, Director of the Alfort Veterinary College, has informed the Royal College of Veterinary Surgeons in London of the death of the eminent French veterinarian, Professor E. Leclainche. We hope to publish a memoir in an early issue.

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LIVESTOCK AND THE LEY

A well attended meeting organised by the Berks A.E.C. was held in Newbury on Wednesday, November 18th.

Dr. William Davies, Director of the Grassland Research Station, Hurley, discussed "the ley and its possibilities," and pointed out that of the 14,000,000 acres of land under grass only 3,500,000 were "temporary," and of this only about 2 per cent. was first-class. Whilst the productivity of good permanent pasture could approximate to that of a good ley, there was so much poor pasture that a good dividend was to be expected by ploughing this up. The ley was a cheap way of feeding cattle and sheep and enabled the grazing season to be extended at both ends as well as providing a surplus for conservation as silage for use at other times. The properties of various seeds mixtures and the right use of nitrogen fertilisers were also dealt with.

Mr. S. S. Boden, Nutrition Chemist, N.A.A.S. of Yorks and Lancs province, brought out many points of interest in relation to the management and the fluctuating nutritive values of leys. The digestibility of the protein in the grass declines as the season progresses, whilst the total quantity of the herbage increases. The state of pasture when grazed or cut would, therefore, vary greatly with the time of the year.

Dealing with the veterinary aspect of the grazing of leys, Dr. Barron, V.I.O. of the Reading province, explained that the position could now be viewed in a better perspective and that many of the diseases associated with the ley were in fact caused indirectly and often due to bad management. He thought that too much emphasis had been laid on the danger of infertility, that over-stocking might well occur, thus precipitating parasitic infestation, and that bloat was probably the only serious problem for which the ley could often be blamed; but he pointed out that when more was known about the causation of bloat we might be able to avoid this even on the best "blowing pastures."

N. S. B.

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A FORTHCOMING BROADCAST

Members of the Veterinary Profession may be interested to know that to-day (Saturday), at 5.25 p.m. in the Home Service of the B.B.C., there is a programme for "teenage" children entitled "I Want to be a Veterinary Surgeon." The voices of two veterinary surgeons in practice in town and in the country and of two of the Directors of Veterinary Research Institutes, also of a number of the staff of the Royal College of Veterinary Surgeons, will be heard in this programme.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax:

Ayr.—Altimeg Farm, Ballantrae (Dec. 1).
Lancs.—Crooks Farm, Wigan Lane, Coppull, Chorley (Dec. 1).
Warwicks.—Sleath Farm, Gilmorton, Rugby (Dec. 3).

Foot-and-Mouth Disease:

Lancs.—Ringley Fold Farm, Stoneclough, Nr. Manchester (Dec. 3).
Warwicks.—Stone House Farm, Fillongley, Coventry (Dec. 2).

Fowl Pest:

Cambs.—92, Bridge Street, Chatteris; Dock Road, Chatteris (Dec. 3).
Dorset.—North End, Motcombe, Shaftesbury (Dec. 2).
Essex.—Laylands, Downham, Billericay; Great Waltham, Chelmsford (Dec. 2).
Lancs.—Woodhall Poultry Hut, Keighley Road, Trawden, Colne; White Lee Poultry Farm, and Wanless Farm, Trawden, Colne (Dec. 2).
Notts.—2, Holden Buildings, Nottingham Road, Cinderhill, Nottingham (Dec. 2).
Worcs.—Mill Bridge House, Chaddesby Corbett, Kidderminster (Dec. 3).
Yorks.—Sandwath Farm, Church Fenton, Tadcaster (Dec. 3).

Swine Fever:

Cambs.—5, Gipsy Hall Cottages, Dullingham, Newmarket (Dec. 2); Glebe Farm, Willingham, Cambridge (Dec. 3).
Ches.—Heath Farm, Weston, Crewe (Dec. 2).
East Lothian.—No. 12 Holding, Ballencrieff, Longniddry (Dec. 5).
Kent.—Allotments at Currant Hill, Westerham (Dec. 2); Bennetts Orchard, Station Road, Rainham, Gillingham (Dec. 5).
Norfolk.—New Road Farm, Acle, Norwich (Dec. 2); Scarning Farms Ltd., Church Farm, Scarning, Dereham (Dec. 5).
Northants.—Middle Farm, Chelveston, Wellingborough.

Oxon.—Warden Grange, Chipping Warden, Banbury (Dec. 2).
Salop.—The Moss Farm, Webscott, Myddle, Shrewsbury (Dec. 3).
Surrey.—20, Smallholdings, Woodmansterne Lane, Little Woodcote, Carshalton; Little Tugley Farm, Fisher Lane, Chiddingfold (Dec. 5).
Sussex.—Coombelands Farm, Pulborough (Dec. 3).
Warwicks.—Tile Hill Riding School, Tile Hill, Coventry (Dec. 2).
Wilts.—Elbrough Farm, Ermin Street, Stratton-St. Margaret (Dec. 2).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

GUT OEDEMA IN PIGS

Sir,—From time to time cases of gut oedema occur in pigs, and the veterinary surgeon in attendance expresses the opinion that the food has been responsible.

In view of the present position of our knowledge, and the lack of any evidence that the food has more than an incidental connection with the disease, it would help their colleagues engaged in the field of animal nutrition if practitioners were to be more guarded in their condemnation of the food as being responsible for the deaths of pigs from this disease.

The findings of the Irish workers and others in this country and abroad make it abundantly clear that this is no simple story, and that probably an infective agent has a greater share in the causation of the disease than any other factor.—Yours faithfully, W. M. McKay, 40, St. Mary Axe, London, E.C.3. *December 1st*, 1953.

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A FARROWING PHENOMENON

Sir,—An interesting occurrence which I came across the other day may be deemed worthy of record in your columns.

A large white sow carrying her third litter gave birth to 10 piglets on November 5th. She appeared to be slightly restless during the next three weeks and at night she killed her young until on November 30th four piglets remained. Imagine the farmer's surprise when on the morning of December 1st she produced a second litter of 10 piglets, one of which was a dead weakling.

I suggested that the sow had been served at a following oestrus but the farmer denies this emphatically as he sends his sows to a neighbour's boar.

Have any of your readers met a similar case?—Yours faithfully, Andrew Buie, 11, North Guildry Street, Elgin. *December 4th*, 1953.

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CANINE DISTEMPER PROPHYLAXIS

Sir,—Although it is early to give a considered opinion on the new egg-adapted virus, we feel that w[illegible] so costly a treatment the sooner the value of the product both as a prophylactic and a therapeutic measure can be decided the better for the good standing of the profession. We therefore venture to give the results of 76 cases treated here, 59 prophylactically and 17 therapeutically, in the hope that other veterinary surgeons will also let us know of their findings as soon as possible.

We have given 61 prophylactic doses, mainly to pups between three and six months, although one was only eight weeks and nine were over one year. Two of these cases developed para-distemper within the next two weeks, but they were known to be in contact with the disease and may, therefore, have contracted it before the inoculation. We have therefore included these two cases amongst those treated therapeutically. In both cases litter mates inoculated at the same time have shown no ill-effects.

Of the 17 dogs treated therapeutically six have recovered and 11 have died or been destroyed.

Of those that recovered one was treated so early that it may have been a false alarm, four were treated when nasal and ocular discharges first appeared and made an uneventful recovery, and one was treated later when an interstitial pneumonia had already developed. This last made a most startling and rapid recovery.

Of the fatalities two were the in-contacts mentioned above, one, also a known in-contact, was treated at the first rise of temperature, six were treated soon after nasal and ocular discharges first appeared, and two not until later when diarrhoea had developed. All these dogs died or were destroyed after having had chorea and/or epileptiform fits from 6 to 30 days after the injection. Several showed an improvement a few days after the injection only to fall back later. In no case was a repeat dose given.—Yours faithfully, Oliphant F. Jackson, Elizabeth K. M. Jackson, Victoria Road, Darlington. *December 7th*, 1953.

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GLANDULAR IMPLANTS FOR SKIN DISORDERS IN CATS

Sir,—With reference to Mr. Comben's article in this week's *Veterinary Record*, I have not used implants in male cats, but during the summer tried the effect of stilboestrol implants in three desperate cases of miliary dermatitis in spayed females (all tortoiseshell). I used a pellet injector and chose the flank. So far results have been very satisfactory as to fur growth.—Yours faithfully, Zoe Bonnaud, 54, Teville Road, Worthing. *December 6th*, 1953.

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THE VETERINARY ASSISTANT PROBLEM

Sir,—According to his letter in *The Veterinary Record* of November 21st, Mr. A. V. B. Foster seems to be looking for an ideal veterinary assistant. I should like to ask him if he has an ideal veterinary practice. As I have some experience of assistantships I feel I should like to draw Mr. Foster's attention to the other side of the picture.

My first assistantship after qualifying—when I was very young and "green" but determined to work hard and acquire useful knowledge—was a living-in post where after the day's work was done I was expected not only to darn socks but re-foot them and iron the family wash, including long woollen underpants. My room was small, bleak and bare. I had absolutely no privacy, so I acted with dignity and restraint and gave a month's notice. As to methods of treatment, I certainly learned there how a veterinary practice should *not* be run.

Since then, with a few notable exceptions, the practices I have had experience of have all been of a similar type and characterised by a rooted objection to soap and water. As my experience grew I realised that a veterinary assistant with ideas of her own was not popular with her employer, and I was eventually driven into the voluntary societies where cleanliness, a well-trained lay staff and proper equipment make ideal working conditions.

It may be, however, that my ideas are all wrong and that slipshod methods bring success for having recently put up my plate I am now starving (though happy) in my own practice.—Yours faithfully, Ruth McLelland, 34, Heathcote Road, St. Margaret's, Twickenham. *December 1st*, 1953.

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VETERINARY GRADUATES AND NATIONAL SERVICE

Sir,—The following extracts from a circular recently issued to all veterinary colleges by the Association of Veterinary Students may interest your correspondent, Mr. Foster, and other readers:—

"*A.V.S. and National Service.*

(1) *A year's post-graduate experience in general practice.*

A.V.S. wrote to the Minister of Labour on July 3rd, 1953, suggesting that graduates should be granted further deferment for one year in general practice in order to complete their training. This suggestion was rejected. (This object is achieved in other professions by making a year's practice compulsory before being entered on a permanent register.)

(2) *Service in the Ministry of Agriculture.*

A.V.S. suggested to the Ministry of Agriculture that the period of service could be carried out in their veterinary division. This suggestion has been rejected."—Yours faithfully, R. J. Thomas, *Hon. Secretary*, A.V.S., on behalf of the Executive Committee, Association of Veterinary Students, Langford House, Langford, Nr. Bristol, Somerset. *December 5th*, 1953.